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AUTHOR Rodier, Dominique
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ABSTRACT

It is proposed that some reduplication processes found in Kwakiutl, a native language of British Columbia, can be explained in a very illuminating way within a moraic theory. It is argued that the cases of so-called reduplication found in Kwakiutl should be viewed as the result of a copying process triggered by the moraic requirement of some affixes rather than as a result of reduplication. The analysis also shows that the influence that affixes seem to have on the internal structure of stems (i.e., lengthening or shortening) follow from the prosodic structure of both stems and affixes, from the prosodic requirement of the affixes in question, and from language-specific constraints on possible prosodic words. (Contains 7 references.) (MSE)

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PROSODIC AFFIXATION IN KWAKIUTL

Dominique Rodier
McGill University

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1 Introduction. In this paper, I intend to show that some reduplication processes found in Kwakiutl, a native language of British Columbia, can be explained in a very illuminating way within a moraic theory first proposed in McCarthy and Prince (1986). I will argue that the cases of 'so-called' reduplication found in Kwakiutl should be viewed as the result of a copying process triggered by the moraic requirement of some affixes rather than as resulting from reduplication. I will also argue that the influence that affixes seem to have on the internal structure of stems, i.e. lengthening or shortening, can be shown to follow from the prosodic structure of both stems and affixes, from the prosodic requirement of the affixes in question and from language-specific constraints on possible prosodic words.

In McCarthy and Prince (1986), the forms that reduplication processes can take are shown to follow from a choice made within a typology of prosodic units that can be affixed to the stem, (e.g. F 'foot'; $^{\sigma}$ 'syllable'; $^{\sigma}\mu$ 'light syllable'; $^{\sigma}\mu\mu$ 'heavy syllable'), and by assuming maximally binary feet, i.e. iambic feet [$^{\sigma}\mu$ $^{\sigma}\mu\mu$] and balanced feet [μ μ]. In this paper, I assume a moraic theory as advocated in McCarthy and Prince (1986) and Hayes (1989) in which light syllables are represented as having one mora and heavy syllables as having two morae. Following Hayes (1985), I also assume that quantity-sensitive languages only allow for iambic feet, balanced feet and, when permitted, monomoraic feet [$^{\sigma}\mu$].

2 The Kwakiutl language. Kwakiutl is a native language spoken on the coasts of Queen Charlotte Sound in British Columbia. It has a great number of back consonants and a series of glottalized consonants. In fact, each plain stop, affricate and sonorant has a glottalized counterpart. As for the vowel system, it can be analyzed as having only one short vowel [ə] and one long vowel [ə̄] underlyingly. All the other vowels found in the language can be shown to derive either from a sequence of schwa + glide or a sequence of schaw + glide + ə̄. This is shown in (1). In fact, it could be argued that Kwakiutl has a one vowel system since the shortening of the long vowel [ə̄] often gives [ə], while the lengthening of [ə] always results in [ə̄].

1. Derivation of mid-vowels in Kwakiutl

a.	[t^{h}ə́xit]	(t^{h}əy-)	(-x^{ʔ}it)	'to wipe' [1]
	[q̓ə́nəm]	(q̓əy-)	(-nəm)	'many'
	[yə́x^{w}it]	(yəw-)	(-x^{ʔ}it)	'wind blows'
	[p̓ə́k^{w}ən]	(p̓əw-)	(-k·ən)	'with white spots on body'

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b.	[wɛ́nəm]	(wəy-),	(-ānəm)	'fail to obtain'
	[wɛ́xə]	(wəy-),	(-āxə)	'not to reach down'
	[c̓ɔ́nəm]	(c̓əw-),	(-ānəm)	'obtained by giving'
	[n̓ɔ́xə]	(n̓əw-),	(-āxə)	'to aim down'

The language can be shown to be quantity-sensitive with the following stress rule: Stress first syllable with long vowel or vowel plus tautosyllabic sonorant or if none, stress last syllable. If we assume that each element in a sequence of vowel plus tautosyllabic sonorant receives a mora, and that a bimoraic syllable is considered a heavy syllable, the stress rule of Kwakiutl can be reformulated as follow: Stress first heavy syllable or if none, stress last syllable. There is evidence that the class of sonorants which receive a mora cannot include the glottalized series. This is shown by the position of the stress in the forms given in (2a). The data are from Boas (1947). There is also a class of suffixes which glottalize the last consonant of the stem they attach to. When a moraic sonorant becomes glottalized, it patterns like any other non-moraic consonant in that position. This is illustrated in (2b.) and (2c.).

2a. Plain versus Glottalized Sonorants

a.	[c̓ə́mc̓ōd]	(c̓əm-)	(-c̓ōd)	'to point into'
b.	[c̓əm̓c̓ōd]	(c̓əm̓-)	(-c̓ōd)	'to melt away inside'
c.	[sə́lsəm̓ūɬʰ]	(səl-)	(-m̓ūɬʰ)	'what is left after drilling'
d.	[c̓əc̓əm̓əm̓úɬʰ]	(c̓əm̓-)	(-m̓ūɬʰ)	'left after melting'
e.	[ɬ̓ā́məs]	(ɬ̓əm-)	(-əs)	'place of sewing with cedar withes'
f.	[hā̓m̓ə́s]	(hā̓m̓-)	(-əs)	'place where one eats'

b. Stable suffix (-k·a̓ɬə)

[wəwə́nk·a̓ɬə]	(wən-)	'to drill without looking'
[cʰəcʰə́k·a̓ɬə]	(cʰəy-)	'to draw water precipitately'
[x·ə̓mk·a̓ɬə́]	(x·ə̓m-)	'to snare without consideration'

c. Glottalizing suffix (-ɬəm)[2]

[w̓əw̓ənəm]	(w̓ən-)	'really to hide'
[pəpəw̓ə́m]	(pəw-)	'really to leave'
[ɬə́l̓əm]	(ɬəl̓-)	'really dead'
[c̓ə́m̓əmx̓it]	(c̓əm̓-)	'it begins really to melt'

3 Prosodic Requirement of Affixes. As noted in section 1, according to McCarthy and Prince (1986), the forms that reduplicative affixes can take follow from a choice made among a typology of universal prosodic units. Along with the reduplicative affix, a copy of the melody of the stem is made available for mapping. In Kwakiutl, there are at least three classes of suffixes which seem to trigger reduplication of the stem. The three classes of suffixes are illustrated in (3), (4), and (5).

3. Reduplication of the type *Cə* for all the stems: e.g. [=ələ] 'to do in return'; [-lə] 'to be ready to... ; to try to...'].

a. [sə́yək·ə]	(sək^{h}·-)	'to be about to spear'
b. [cə́cəmə]	(cəm-)	'to be ready to sew with cedar twigs'
c. [nə́nəwə]	(nəw-)	'to be ready to aim'
d. [wə́wocəmə]	(wəcəm)	'to be ready to plead'
e. [ɬə́ɬecə]	(ɬəs-)	'to try to get stones'

4. Reduplication of the type *Ce* : e.g. [-k^{h}'ən] 'too much'; [-ləm] 'exclusively; real, really'.

a. [mə́nəm]	(məx·-)	'hit with fists and nothing else'
b. [lə́k·əm]	(lək^{h}·-)	'throw, pound with stones and nothing else'
c. [wəwənə́m]	(wən-)	'really to hide'
d. [pəpəwə́m]	(pəw-)	'really to leave'
e. [k·ək·ə́k^{w}əm]	(k·ək^{wh}-)	'a house and nothing else'
f. [k·ək·ə́ɬəm]	(k·əlt^{h}-)	'really long'

5. Reduplication for bimoraic stems; lengthening for monomoraic stems: e.g. [-lq^{h}ə], [-ləq^{h}] 'to do inside'; [-mə́ɬ^{h}] 'useless, refuse'.

a. [nə́cəq^{h}]	(nəs-)	'fish not properly dry inside'
b. [k·ə́lk·əq^{h}ə]	(k·əl-)	'to crawl into'
c. [sə́ləmɬ^{h}]	(səl-)	'what is left after scooping up
d. [q^{h}ə́q^{h}əsmɬ^{h}]	(q^{h}əs-)	'tracks
e. [yə́nyətmɬ^{h}]	(yənt-)	'knawings' [sic] (not of mouse)

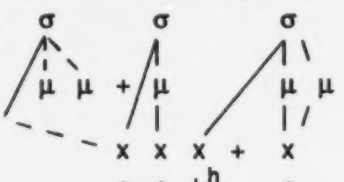
Within the first class, the affixation of a suffix such as [-ə] 'to be ready to..' or [-ələ] 'to do in return' seems to result in the prefixation of a reduplicative affix of the form Cə-, without any consideration to the internal structure of the stem to which they are attached. With regard to the second class of suffixes,

affixation of a suffix such as [-k^{h}·ən] 'too much' or [-ləm] 'real, really' triggers reduplication of the form <u>Cə-</u>, but only when attached to a bimoraic stem. As for the third class of suffixes, affixation of, for example, [-m̥ɯ̄t^{h}] 'useless, refuse' or [-lq^{h}ə̆] 'to do inside' to a bimoraic stem triggers the prefixation of a bimoraic reduplicative affix onto which the melody of the stem can be copied. When attached to monomoraic stems, both the second and third class suffixes trigger lengthening of the stem vowel instead of a reduplication process. Note then that, in the first two groups, the forms that the reduplicative affixes take are not in any way what would be expected if the whole melody of the stem was available for copying.

3.1 <u>Copying vs. Spreading.</u> With regard to the two classes of suffixes represented in (3) and (4), I am going to present an analysis of these forms without resorting to a reduplicative affix with prespecified vocalic elements. In fact, I am going to argue that these forms result not from a 'so-called' reduplication process but rather from the moraic requirement of the affixes in question. Let us look then at the first class of suffixes. What is of particular interest in this group of affixes is the fact that the prefix is invariably of the form <u>Cə̆-</u>, independently of the internal structure of the stem. To explain the forms found in (3), I propose that the lexical representation of the suffix [-lə̆] be that of a disjunctive morpheme consisting of two prefixed unassociated morae and a suffix. This morpheme would be affixed to both bimoraic and monomoraic stems. The result of this type of affixation is exemplified in (6).

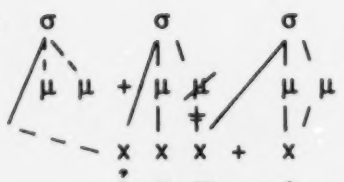
6. [[μμ] -ə̆] 'to be ready to...; to try to...'

a.



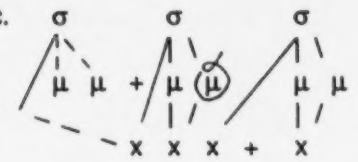
[sə̆yək̆·ə] 'to be ready to strike'

b.



[c̆ə̆c̆əmə̆] 'to be ready to sew with cedar twigs'

c.



[tɛ́tɛ́cə̄] 'to try to get stones'

The prefixed unassociated morae cannot be incorporated into any already existing syllable since there is a universal limit of two morae per syllable. To preserve the prosodic requirement of the suffix, the unassociated morae have to be incorporated into an initial syllable, as shown in the derivations in (6.). In cases of reduplication, a copy of the whole stem melody would be available for mapping onto the reduplicative affix, but since this is not reduplication at work, the empty positions can only be filled through spreading.[3] Note that the consonant in the onset of the stem is the only element which can spread without crossing lines. The positions linked to the morae have to stay empty and are interpreted as [ə̄], the phonetic realization of the vowel [ə] when linked to two morae. As for the shortening of the stem syllable in (6c.), the application of this process results from the presence of a constraint on possible prosodic words in the grammar. This constraint is given in (7).

7. Prosodic Word Constraint:
   Words of the form [$^{\sigma}$ μμ] [$^{\sigma}$ μμ] [$^{\sigma}$ μμ] are not allowed.

With regard to the shortening of the stem syllable in (6b), the Prosodic Word Constraint is not violated, since the glottalization of the sonorant by the suffix [-lə̄] has already triggered the loss of the second mora.

Let us look now at the class of suffixes which seems to have a reduplicative affix of the form Cə-. This class can be divided into two main subgroups. The first group has the property of triggering copying when attached to bimoraic stems and vowel lengthening when attached to monomoraic stems. The second group of affixes triggers copying only for stems whith long vowels. All the other stems have their vowel lengthened. These two groups are illustrated in (8) and (9).

Copying of the type *Cə* :

8. Copying for bimoraic stems and vowel lengthening for monomoraic stems:
   [-k^{h}'ən] 'too much'; [-ləm] 'exclusively; real, really'.

a.	[mə́nəm]	(məx·-)	'hit with fists and nothing else'
b.	[lə́k·əm]	(lək^{h}·-)	'throw, pound with stones and nothing else'
c.	[wəwənə́m]	(wən-)	'really to hide'
d.	[pəpəwə́m]	(pəw-)	'really to leave'

e. [k·ək·ǒkʷəm] (k·ǒkʷʰ-) 'a house and nothing else'

f. [k·ək·ə́l̂əm] (k·əltʰ-) 'really long'

9. Copying for stems with long vowels and lengthening otherwise: [=əx·sə̄], [=əkʰ·sə̄], [=əkʰ·sə̄lə] 'away without definite aim'

a. [p̂ə́x̌əkʰ·sə̄] (p̂əx̌ʰ-) 'to fly away'

b. [k·ə̄ləx·sə̄] (k·əl-) 'to crawl anywhere'

c. [tə̌yəkʰ·sə̄lə] (təy-) 'to wipe off anywhere'

d. [qʰəqʰə́səkʰ·sə̄] (qʰə̄s-) 'to walk away'

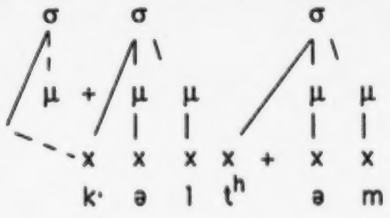
e. [ĉə̌x·əkʰ·sə̄] (ĉə̄x·-) 'to carry round things away on shoulder'

f. [ĉəĉə̌x·əkʰ·sə̄] " " " "

Although copying never applies to monomoraic stems, I am going to propose that the suffixes in question are invariably represented in the lexicon as a disjunctive morpheme consisting of a prefixed unassociated mora and a suffix. This morpheme would be affixed to both bimoraic and monomoraic stems. The result of this type of affixation is exemplified in (10).

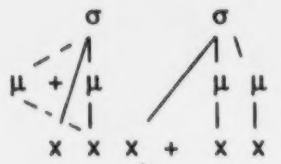
10. [[μ] -əm] 'exclusively; real, really'

a.



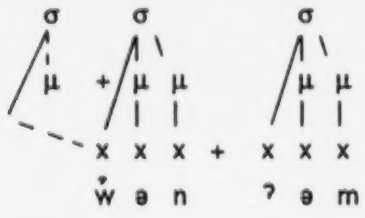
[k·ək·ə́l̂əm] 'really long'

When attached to bimoraic stems, the prefixed unassociated mora cannot be added to the stem syllable since it already contains two morae. To preserve the prosodic requirement of the suffix, the unassociated mora has to be incorporated into an initial syllable. Since there is no melody copying possible, spreading is the only process which can be used to fill the empty positions of the initial syllable. As shown in (10a.), the only element which can spread to fill any of the empty positions of the initial syllable without crossing lines is that of the consonant in the onset of the stem syllable. The position linked to the mora has to stay empty and is interpreted phonetically as [ə]. When affixed to a monomoraic stem, on the other hand, there is an existing syllable onto which the mora can be incorporated, that of the stem syllable, resulting in a bimoraic long vowel. The fact that incorporation into an already existing syllable takes priority over that of creating a new syllable can be seen simply as the law of least effort.

b. 

[lə́k̓·əm] 'pound with stones and nothing else'

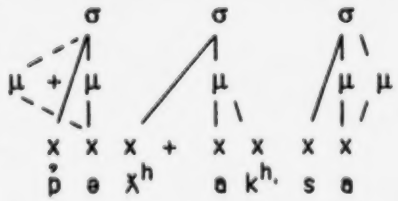
Consider now the form in (10c.). As shown by the stress position, the initially bimoraic stem has lost its second mora through glottalization of the sonorant. Note, however, that the prefixed unassociated mora is incorporated into an initial syllable. This means that the stem was still bimoraic after affixation. To account for this discrepency with regard to the prosodic status of the stem sonorant, I propose that glottalizing suffixes have the form shown in (10c.). When affixation applies, the onset of the suffix is already filled by a glottal stop and the sonorant stays part of the stem syllable. This syllable is, therefore, still bimoraic when the unassociated mora is prefixed to it. The sequence of a consonant followed by a glottal stop is not allowed in Kwakiutl, however. To repair the sequence violation, fusion applies at the segmental level resulting in a glottalized consonant syllabified into the onset of the last syllable.

c. 

[w̓əw̓ən̓əm] 'really to hide'

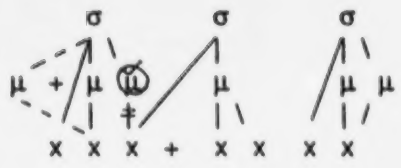
Note that this subgroup of suffixes which trigger copying for all the bimoraic stems all begin with a consonant or a glottal stop (i.e. a glottalizing suffix). With regard to CVm stems, it means that when affixation applies the sonorant is still part of the stem syllable. In fact, the vowel initial suffixes which do not glottalize the last consonant of the stem allow for the incorporation of the unattached prefixed mora into the stem syllable. The forms are shown in (9) above, and the derivations of some of those forms are illustrated in (11).

11. [μ] -ə̌k^{h}·sə̄] 'away without definite aim'

a. 

[p̓ə́x̌ək^{h}·sə̄] 'to fly away'

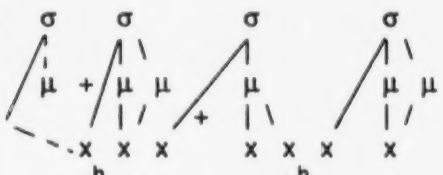
b.



[k·ə́ləx·sə̄] 'to crawl anywhere'

In both (11a.) and (11b.), the prefixed mora is incorporated into the stem syllable after the rule of Onset creation has resyllabified the last consonant of the stem into the following empty onset. This Onset creation rule has to be considered obligatory, since it always applies whenever its structural requirement is met. The result, in both cases, is that the unassociated mora is incorporated into the stem syllable. This syllabification of the prefixed mora into the stem syllable blocks, in the case of CVm stems, any possible preservation of the unlinked mora left behind by the resyllabification of the sonorant into the following syllable, as shown in (11b.). As for the other bimoraic stems, the unattached mora can only be incorporated into an initial syllable.

c.



[q^həq^hə́sək^h·sə̄] 'to wipe off anywhere'

Let us look now at the class of suffixes which seem to have the kind of results anticipated by McCarthy and Prince. This is the class of suffixes illustrated in (5) above and given again in (12).

12. <u>Copying for bimoraic stems; lengthening for monomoraic stems;</u> [-lq^hā], [-ləq^h] 'to do inside'; [-m̓ū́t^h] 'useless, refuse'.

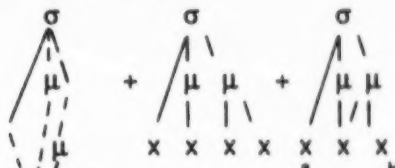
a. [nə́c̓əq^h] (nəs-) 'fish not properly dry inside'
b. [k·ə́lk·əq^hə̄] (k·əl-) 'to crawl into'
c. [səlsəm̓ūt^h] (səl-) 'what is left after scooping up
d. [q^hə́q^həsm̓ūt^h] (q^hās-) 'tracks
e. [yə́nyətm̓ūt^h] (yənt-) 'knawings' [sic] (not of mouse)

It is interesting to note that only the onset consonant and the moraic segments of the stem are copied onto the reduplicative affix. Another interesting fact is that these suffixes trigger reduplication only when attached to bimoraic stems. They all seem to trigger vowel lengthening when attached to monomoraic stems. I am going to propose that this third class of suffixes is, in fact, another subgroup of the second type of suffixes. I am going to argue that the forms shown in (12)

can be derived from the affixation of a suffix which would also be represented as a disjunctive morpheme consisting of a prefixed unassociated mora and a suffix. This type of suffix, however, would have an added feature which would trigger copying of the stem melody. In other words, the suffix would have the form shown in (13), [[μ] -m̥ʊ̄tʰ], with the diacritic REDUPL. as part of its lexical representation.[4]

13. [[μ] -m̥ʊ̄tʰ]$_{REDUPL.}$

a.



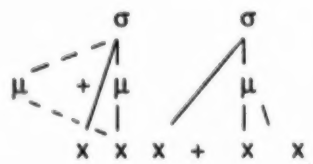
[yənyətm̥ʊ̄tʰ] 'knawings'

b.

[qʰə́qʰəsm̥ʊ̄tʰ] 'knawings'

As shown in the first two derivations, the prefixed unassociated mora has to be incorporated into an initial syllable. In contrast with the other classes of affixes, however, there is a copy of the melody available for mapping. In (13a.), the vowel is mapped onto the prefixed mora, while the inherently moraic sonorant projects its own mora. This second mora is incorporated into the initial syllable resulting in a bimoraic syllable. In (13b.), the stem vowel is mapped onto the the mora of the initial syllable. Since the stem vowel is underlyingly long, it projects an additional mora which is also incorporated into that initial syllable, again resulting in a bimoraic syllable. Note that the last consonant of the stem in both derivations cannot map onto the initial syllable since it has nothing to project. As for the shortening of the stem vowel of the derived form in (13b.) and the deletion of the sonorant in (13a.), the application of those two processes results from the presence of the Prosodic Word Constraint in the grammar.

c.



[nə̆c̥əqʰ] 'fish not properly dry inside'

With regard to monomoraic stems, the prefixed unassociated mora is simply incorporated into the stem syllable, resulting in a bimoraic long vowel. The copied melody, although present, has to stay invisible since there is no higher prosodic structure available onto which it can map to be licensed.

4 Conclusion. In conclusion, I have shown that the reduplication processes found in Kwakiutl can be analyzed without resorting to a reduplicative affix with prespecified vocalic elements or any other kind of reduplication process. I have, in fact, shown that the 'so-called' reduplication processes should be viewed rather as a copying process triggered by the prosodic requirements of the affixes in question. I have also shown that all the facts about the influence of suffixes on the internal structure of the stems (i.e. lengthening and shortening) can be derived from the interaction between the prosodic structure of both stems and suffixes, along with the prosodic requirements of some of those suffixes and some language-specific constraints on possible prosodic words.

FOOTNOTES

1. The representation of consonants in the forms in (1) differs from that of Boas (1947) in that I follow Sapir (1938) in assuming a plain voiceless series instead of Boas' voiced stop series. I also represent the strong aspiration of the fortis voiceless series.

2. Following Boas (1947), I use the symbol [-l...] to indicate a glottalizing suffix. I also use the symbol[=...] to indicate a suffix which triggers some lenition of the last consonant of a stem.

3. The assumption that this filling up of a syllable empty positions is limited to segments which can spread without crossing lines has already been pointed out in McCarthy (1984: 411) and Steriade (1982: 200).

4. I am indebted to Glyne Piggott for suggesting this analysis to me.

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